

We Claim:

1. A process for regiospecific chlorination of an aromatic or aliphatic compound with a chlorine source comprising a metal chloride and other than Cl_2 and SO_2Cl_2 in presence of hypervalent iodine catalyst and in acidic medium.
2. A process as claimed in claim 1 wherein the aliphatic compound is selected from alkanes and alkenes.
3. A process as claimed in claim 1 wherein the aromatic compound is selected from arenes.
4. A process as claimed in claim 1 wherein the reaction is carried out at a temperature in the range of $70-80^\circ\text{C}$ for a time period in the range of 4-24 h.
5. A process as claimed in claim 1 wherein the reaction is terminated by bringing the reaction mixture to ambient temperature followed by extracting and purifying the product.
6. A process as claimed in claim 5 wherein the extraction is done by solvent extraction.
7. A process as claimed in claim 1 wherein the chlorine source is sodium chloride.
8. A process as claimed in claim 1 wherein the hypervalent iodine (iodine valency ranging from +3 to +7) catalyst is selected from the group consisting of NaIO_4 and $\text{PhI}(\text{Oac})_2$, preferably NaIO_4 in liquid phase.
9. A process as claimed in claim 1 wherein the reactants are dissolved in a solvent selected from the group consisting of DMF, dioxane, H_2O , acetonitrile, chloroform, ethylene dichloride, and any combination thereof.
10. A process as claimed in claim 9 wherein the solvent comprises a combination of CH_3CN : water (2:1).
11. A process as claimed in claim 1 wherein the pH of the reaction mixture is brought to a range of 2-6 by addition of 10-20% mineral acid solution.